

SP-T4 Biodiversity, Vegetation Communities and Wildlife Habitat Mapping

October 25, 2002

1.0 Introduction/Background

Vegetation cover and land use data maps is a necessary tool for planning resource studies and determining management options. They can help to identify areas that provide important habitat for threatened, endangered, or special status plant and animal species as well as help to determine which areas are vulnerable to habitat loss, degradation, or fragmentation due to project-related operations. They are also necessary for planning and conducting restoration projects especially following natural disasters such as a fire or a flood.

The only existing data source for the project area is the California GAP (Geographic Approach to Planning for Biological Diversity) Analysis Project, a cooperative effort between the U.S. Fish and Wildlife Service and the University of California at Santa Barbara. These data maps were produced using small-scale photography of 1:100,000 to describe general land cover. It is not adequate to provide sufficient resolution necessary for planning studies or assessing project effects required under the FERC license. Riparian vegetation along the Feather River downstream of the Fish Hatchery was mapped by CSU Chico's Geographic Information Center in 1996 and 1997. The 1:12,000 aerial photography used to map the riparian vegetation was taken in 1995, 1996, and 1997. The majority of the aerials used for mapping the Feather River riparian vegetation were taken prior to the 1997 floods and do not adequately depict the current conditions along the river. In addition, a field reconnaissance of the Feather River in the Fall of 2001 identified discrepancies and/or changes in a number of the vegetation polygons.

Vegetation maps will be produced using aerial photo interpretation together with ground-based surveys to produce a Geographic Information System (GIS) database of land cover with species specific information. These vegetation cover classes can be converted to wildlife habitat classes used by the California Wildlife Habitat Relations (CWHR) System to help predict wildlife use and develop management options.

2.0 Study Objectives

The objectives of this study are to 1) complete plant community and wildlife habitat mapping for evaluating project related effects on biological resources and 2) provide ecological data on the existing conditions and project related effects on vegetation and wildlife resources associated with the project pursuant to the CEQA, NEPA, and FERC regulatory framework.

3.0 Relationship to Relicensing/Need for the Study

A vegetation cover map will be included in the license application to describe the botanical resources of the project-affected area.

These vegetation cover and wildlife habitat maps will be used to plan other studies related to botanical and wildlife resources and to assess a number of other issues of concern including 1) extent and acreages of plant communities and wildlife habitat (SP T1); 2) endangered or threatened species habitat (SP T2); 3) riparian and

wetlands habitat (SP T3/5); 4) development of a wildlife management plan (SP T6); 5) recreation and wildlife (SP T9); 6) upland plant communities, revegetation and restoration (SP T10); and 7) fuels and fire prevention (SP T11). These mapping efforts will be coordinated with the mapping studies in SP T7 (noxious weeds).

This information will provide the relicensing participants with information on the botanical and wildlife habitat associated with the project. It will help to address operation effects such as water fluctuation levels, recreation, and maintenance and construction activities on plant communities and wildlife habitat types. The existing data source is not adequate or at a resolution necessary for planning studies or assessing project effects.

4.0 Study Area

The Study Area includes all areas within one mile of the FERC project boundary and downstream Feather River floodplain to the confluence with the Sacramento River. This Study Area includes the geographic area of concern for potential direct and indirect impacts at project facilities on biological resources due to project maintenance and operations. The Feather River (within the FEMA 100-year floodplain) from the Fish Barrier Dam to the confluence with the Sacramento River will be assessed for potential indirect effects due to operations for flood management and water releases. Study plans approved by the Environmental Work Group defined the limits of the study area. If initial study results indicate that the study area should be expanded or contracted, the Environmental Work Group will discuss the basis for change and revise the study area as appropriate.

5.0 General Approach

If initial study results indicate that the methods and tasks should be modified, the Environmental Work Group will discuss the basis for change and revised the study plans as appropriate.

Task 1—Aerial Photography Preparation

Aerial photography was flown for the Department in 1996 and 1999 at a scale of 1:12,000. These photos have been scanned at 600 dpi and will be ortho-rectified, mosaicked, and clipped into workable file sizes using ER Mapper software. The base grid used will be UTM Zone 10, NAD 83. Aerial photography for the Feather River downstream of the project area is currently being flown at a 1:7,200 scale.

Task 2—Develop Preliminary List of Vegetation Types Expected to Occur within the Study Area

In order to define a vegetation classification system to be used for the study area, a preliminary classification system for mapping vegetation in the project area is presented in Table 1. This draft classification system was developed by botanical staff familiar within the project area, in combination with a literature search, California Natural Diversity Database ecology files, and a review of existing vegetation classification and maps of the project area. They are based on the vegetation types used by the Holland vegetation classification (Holland 1986) and those described in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). This list will be modified or refined as necessary in conjunction with preliminary sampling visits.

Table 1. Preliminary vegetation cover/land use types expected to occur within the Oroville Facilities Project Area

Upland Vegetation	
	Forest/Woodlands
	Mixed conifer forest
	Ponderosa pine forest
	Black oak forest
	Canyon live oak forest
	Mixed oak woodland (dense, open phases)
	Valley oak woodland
	Valley oak savanna
	Foothill pine-mixed oak woodland
	Foothill pine-mixed chaparral
	Foothill pine savanna
	Shrublands
	Mixed chaparral
	Whiteleaf manzanita chaparral
	Grassland/Herbaceous
	California annual grassland
Riparian/Wetland Vegetation	
	Forest/Woodland
	Mixed riparian
	Black willow riparian
	Fremont cottonwood riparian
	Valley oak riparian
	Shrublands
	Mixed riparian scrub
	Willow scrub
	Blackberry scrub
	Herbaceous
	(aquatic submerged/emergent vegetation – coordinate with fisheries)
	Freshwater marsh
	Vernal pool
	Disturbed
	Gravel tailings
	Gravel/Sandbar
	Disturbed riparian
	Open Water
	Ponds
	Pools
	Lake
	River
Disturbed/Other	

Urban/disturbed

Irrigated cropland

Orchard

Urban

Ruderal (disturbed, dominated by weedy vegetation)

Bare Ground

Other

Rock outcrop – non-serpentine

Serpentine outcrop

Aerial photos will be used to subjectively locate vegetation patterns related to species composition, landforms, moisture regimes, canopy closures, etc. Sampling locations will be mapped with a GPS recorder. These sample locations will help refine the vegetation classification used for the study area. The methodology for collecting this quantitative data will be the California Native Plant Society Vegetation Rapid Assessment Protocol (2001). Field data will include information on species composition, percent cover, canopy height, geology, elevation, and topography. A sample data form is included in Appendix A.

Task 3—Vegetation Mapping, Accuracy Assessment, and Riparian Vegetation Data

Vegetation patterns will be digitized from the ortho-rectified aerial photos using ArcView software.

Digitizing will typically be performed at a scale of 1:2,400; however, for finer detail a larger scale of up to 1:600 may be used to determine smaller sites. The minimum mapping unit for upland vegetation types will be one acre. Other unique cover types such as riparian and wetland habitats may be mapped as small as 0.1 acre.

The resulting polygons will be labeled with a cover type attribute.

An accuracy assessment of the aerial photo interpretation will be conducted by field visits. A percentage of polygons of each vegetation type will have site visits. Each site will be mapped with a Global Positioning System (GPS). Site data will be recorded on data sheets. A sample accuracy assessment form is included in Appendix A.

Additional data on the riparian vegetation composition and structure will be collected for SP-T3/5 (riparian and wetland habitats analysis). Parameters will include canopy cover, species composition, and structure.

Task 4—Culturally Important Plant Species

Obtain list of culturally important plant species to local Native Americans that have potential for occurring in the project area from the Cultural Resources Work Group. This list should also include high priority species with appropriate minimum mapping units for each species. Low priority species will not be mapped but presence per area or vegetation type will be included in the plant species inventory. Significant populations within the Project boundary and downstream Feather River floodplain will be mapped using a GPS and transferred to a data layer in a GIS database. This information will be provided to the Cultural Resources Work Group and will not be included in the Project's GIS database.

Task 5—Plant Species List

During all botanical field surveys (T2, T3/5, T4, T7, T10), terrestrial and aquatic plant species encountered will be identified (if possible). A list of plant species that occur within the FERC project boundary will be compiled. A separate list will be compiled from the downstream Feather River studies.

Task 6—California Wildlife Habitat Relationships

The classification system used by the CWHR System was developed to predict wildlife habitat relationships. It provides a crosswalk used by CWHR to those used in other vegetation classification systems such as those described above. The habitats used by CWHR are grouped according to vegetative dominance or unique characteristics to which wildlife is thought to respond (Mayer and Laudenslayer, 1988). The vegetation cover/land use maps produced under Task 3 will be converted to the wildlife habitat classification system. These cover types will be further classified through aerial photo interpretation according to percent canopy closure for tree- and shrub-dominated and herbaceous habitats. Site visits will field check the canopy closure data. Field measurements will be taken to describe the habitat's structural condition such as size classes and forest structure.

A preliminary list of California wildlife habitats for the project area includes:

- Riverine
- Lacustrine
- Annual grassland
- Valley/foothill riparian
- Cropland
- Orchard/vineyard
- Urban/residential
- Emergent wetland
- Mixed chaparral
- Blue oak/foothill pine
- Sierran mixed conifer/Montane hardwood
- Ponderosa pine

Task 7—Vegetation Cover/Habitat Type Acreages and Location Maps

The GIS and data produced under Tasks 2, 3, 4, and 6 will be used to generate cover type acreage tables and habitat/vegetation cover type location maps. Large-scale maps will be produced of smaller features such as wetlands, riparian habitat, and culturally important plant species. A table of species diversity related to the density and size classes within each habitat type will be generated.

Task 8—California Wildlife Habitat Relations Analysis

CWHR predictions will be used to determine the species diversity represented by each size and density class of each habitat type. This analysis will serve to identify high diversity habitat types, or high diversity size or density classes within habitat types for protection, mitigation, or enhancement.

Task 9—Analysis of Project Effects

The potential and on-going project effects on wildlife and native plant communities will be evaluated, incorporating information on current and future project-related impact areas obtained from the Recreation Work Group (SP-R5, SP-R9, SP-R10, and SP-R17); Land Use Work Group (SP-LU1 and SP-LU5); and Engineering and Operations Work Group (SP –E2 and SP-E4). A Geographic Information System will be used to develop a quantitative assessment of habitat loss due to the construction of new facilities based on proposed recreational improvements. The evaluation will also include a qualitative assessment of maintenance activities related disturbance to wildlife and plant communities based on field assessment, mapping review, and appraisal of maintenance activities.

6.0 Results and Products/Deliverables

The following products will be developed for this study:

- Summary Report
- GIS Mapping

The report will include:

- A description of the plant and wildlife communities (with areal extent in acres);
- Maps illustrating the distribution of plant communities and wildlife habitat;
- Designation of high value areas of habitats for wildlife;
- Designation of areas which are vulnerable to habitat loss, degradation, or fragmentation due to project operations;
- Identification of areas or habitats of high wildlife and plant species diversity for protection or enhancement purposes;
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- An interim and final list of terrestrial and aquatic plant species and wildlife that occur within the project boundary and lower Feather River; and
- An analysis of potential and on-going project effects to wildlife and native plant communities.

GIS mapping from this effort will include both vegetation cover and wildlife habitat along with a table of acreages for each cover type. Information on the presence of culturally important plant species and locations of significant populations important to local Native Americans will be provided to the Cultural Resources Work Group.

7.0 Coordination and Implementation Strategy

Coordination with Other Resource Areas/Studies

Task 5 will require a list of plants from the Cultural Resources Work Group. The products produced in Tasks 7 and 8 will provide information/data for planning other studies. Task 9 will require information from the Recreation Work Group (SP-R5, SP-R9, SP-R10, and SP-R17), Land Use Work Group (SP-LU1, SP-LU2, and SP-LU5), Cultural Resources Work Group and Engineering and Operations Work Group. This study fully or partially addresses the following Stakeholder issues:

Issues, Concerns, Comments Tracking, and/or Regulatory Compliance

This study addresses “existing and future project effects on biodiversity (including plant species, seral stages, vegetation types and communities and wildlife) and ecosystem health and stability.” Specific Issues directly or indirectly addressed include:

Stakeholder issues fully addressed by SP-T4 Biodiversity, Vegetation Communities and Wildlife Habitat Mapping

- TE4—map plant and wildlife habitat communities
- TE17—maintain habitat to support viable populations of all native and desired nonnative vertebrate species
- TE19—provide diversity of plant and animal communities and tree species by assuring the continuous and viable presence of all seral stages of all native plant communities on the forest
- TE20—provide a diversity of vegetation types and habitat to support viable populations of all fish, wildlife, and plant species
- TE47—continue inventory of plant and animal species in the project area

Stakeholder issues partially addressed by SP-T4 Biodiversity, Vegetation Communities and Wildlife Habitat Mapping

- TE25—maintain viable populations of sensitive plant species. Protect sensitive and special interest plant species, as needed, to maintain viability
- TE62—protection and sustained conservation of terrestrial wildlife and flora in the project-affected area; comprehensive and well-crafted planning

8.0 Study Schedule

Tasks 1, 2, 3, 6, & 7 will have draft products completed by June 2002 with a final product available September 2003. Task 4 and 5 will be completed by August 2003. Task 8 will include an interim product available by September 2002 and completed by September 2004. Task 9 will be completed by September 2003.

9.0 References

California Department of Fish and Game 2000. Vegetation Mapping of Suisun Marsh, Solano County. A Report to the California Department of Water Resources, Sacramento.

CGAP. 2000. California Gap Analysis Project Home Page (web page). Available from http://www.biogeog.ucsb.edu/projects/gap/gap_home.html via the internet. Accessed 2000 Nov. 20.

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Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Unpublished document, California Department of Fish and Game Natural Heritage Division, Sacramento.

Mayer, K.E., and W.F. Laudenslayer Jr., eds. 1988. A guide to wildlife habitats in California. California Department of Forestry. Sacramento.

Sawyer, John and Todd Keeler-Wolf, 1995. A Manual of California Vegetation. California Native Plant Society Press. 469 p.

USGS. 1997. Field Methods for Vegetation Mapping. Available from
<http://biology.usgs.gov/npsveg/fieldmethods/toc.html>

Appendix